Door module for motor vehicles

Patent Number: US2002167195
Publication date: 2002-11-14
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Applicant(s):
Requested Patent: JP2002264652
Application Number: US20020084851 20020226
Priority Number(s): DE20011009452 20010227
IPC Classification: B62D25/04
EC Classification: B60J5/04E
Equivalents: DE10109452, EP1234701

Abstract

The invention relates to a door module (1) for motor vehicles and the manufacture of such a module. The invention is characterized in that the door module (1) is intended for fixation to a door (2) of a motor vehicle and has a synthetic material carrier (1a) as a carrier element, and various function elements and/or reinforcements (11) fixed by synthetic material injection-moulding or connected to the synthetic material carrier (1a) by means of injection-moulded synthetic material

Description

[0001] The present invention relates to a door module for motor vehicles.
[0002] The doors of modern motor vehicles have more and more functions. For example, controls are provided for electric window lifters, electric mirror adjustment or electric seat adjustment. There are also components such as speakers, storage compartments, pockets and holders for a central locking mechanism. These function components must partly be supplied with electric power or have connecting cables for the exchange of electric control signals. Therefore, cables must also be placed in the door. In order to keep manufacturing costs as low as possible, vehicle manufacturers have switched to dividing the door into several components. The main component is of course the car door itself, which usually consists of steel plate, aluminium or synthetic material, and a carrier module that is fixed to the inner side of the car door and carries the controls and function elements. This carrier module is covered with a door lining from the passenger space of a motor vehicle.
[0003] The carrier modules today are almost always manufactured by suppliers and delivered as complete units to the assembly line of a car manufacturer. Due to pressure of prices on suppliers, these are forced to seek the lowest cost solutions with a high degree of automation in the manufacturing process.
[0004] DE 198 33 185 A1 describes the structure of such a carrier module. The carrier module is formed in one piece and has a self-supporting carrier plate of metal as a main component. Function elements of synthetic material are injection-moulded onto this carrier plate, which elements are connected to the carrier plate in one working step.
[0005] It is an object of the present invention to further simplify the manufacture of a door module for motor vehicles and to allow integration of further functions.
[0006] According to the invention, this object is achieved in that the door module is intended for fixation to a door of a motor vehicle and has a synthetic material carrier as a carrier element, and various function elements and/or reinforcements fixed by synthetic material injection-moulding or connected to the synthetic material carrier by means of injection-moulded synthetic material.
[0007] As compared with a metal carrier, the synthetic material carrier has the great advantage that it is simpler and faster and cheaper to produce. Furthermore, a synthetic material carrier is substantially lighter which lowers the overall weight of the motor vehicle. Also synthetic material carriers can be manufactured without problems in all possible shapes. Together with the injection-moulded reinforcements, synthetic

material carriers offer a stability and strength comparable to that of metal carriers. As the reinforcements together with the function elements are fixed to the synthetic material carrier in one working step, the reinforcements constitute no drawback as compared with a metal carrier, which does not require such reinforcements, since no additional working step is required.
[0008] The embodiment defined in claim 2 constitutes a particularly favourable method of manufacturing synthetic material components. The form of a synthetic material carrier is thus designed flexibly, and also mass production is possible. The tray-like shape increases the stability and torsional rigidity of the entire door module.
[0009] With the embodiment defined in claim 3, the process of manufacturing the entire door module is simplified. Seals, buffer elements and even locks are applied by injection moulding synthetic material onto the synthetic material carrier. This is possible with a metal carrier by using only the more expensive outsert technique (metal-synthetic material joint). In contrast, the injection moulding of synthetic material onto synthetic material carriers is considerably easier.
[0010] The embodiments defined in claims 4 and 5 increase the rigidity and stability of a door module. As the door module must be sealed against moisture from the car door and the door lining, a good seal as well as a high stability are required in the area where the door module meets the car door or door lining. Otherwise, the door module can twist and the seal creates gaps through which moisture can penetrate. For this reason, the areas concerned are provided with a channel in the door module, which channel holds a metal wire. This metal wire ensures a high stability and prevents twisting of the door module in these areas and, together with the seals, prevents the penetration of moisture into the door module.
[0011] The embodiments defined in claims 6 to 8 relate to a method of manufacturing a door module according to the invention, claims 9 and 10 relate to a car door and a motor vehicle, respectively, with a door module according to the invention.

[0012] An embodiment of the present invention will now be elucidated with reference to the Figures.
[0013] FIG. 1 is a side elevation of a door module according to the invention in a car door,
[0014] FIG. 2 shows as an exemplary function element a cable bushing of injection-moulded synthetic material,
[0015] FIG. 3 shows a speaker mounting, and
[0016] FIG. 4 shows a motor fixing.

[0017] A car door 2 shown in FIG. 1 contains the door module 1 according to the invention. The door module 1 is mounted on the inner side of the car door 2. Towards the passenger space, the door module 1 is coated with a door lining (not shown). In the manufacture of door module 1, several components are joined together. The door module 1 thus consists of a basic carrier 1a, which is a cut, deep-drawn or blanked synthetic material part. This synthetic material carrier 1a is provided with various function elements and reinforcements. This is done preferably by injection moulding of synthetic material. In the upper area, the synthetic material carrier has cable holders 8 and bushes 9. The cable holders 8 are designed as cable clips in this case. Thus, the cables for power supply and control of electric components such as electric window lifters can simply be pushed or clipped into the cable holders 8.
[0018] To establish the distance between the door 2 and door module 1 or between door module 1 and door lining, flexible buffers 3 and centring bolts 5 are injection moulded onto the synthetic material carrier 1a. As reinforcement elements, metal inserts 12 and door handle fixings 11 with metal-reinforced insert and metal-reinforced screw points 6 are provided. As the door module must be reversibly connected to the door lining of the door 2 in order to allow any maintenance work on the electric components inside the door module 1, the door lining is attached to the door module 1 by means of twist locks 4. One such twist lock 4 is also injection moulded by means of synthetic material onto the door module. The electric components to be installed in door module 1 include, for example, electric window lifters or the central locking control. For the central locking, holders 10 of synthetic material are also injection moulded onto the door module 1.
[0019] Electric components must be protected against moisture, which requires a seal between the door module 1 and car door 2 and between door module 1 and door lining. For this reason, the door module has seals 7 at its edges. In order to achieve a reliable seal along the peripheral edge of door module 1, its peripheral edge has a channel 13a, which holds a wire 13. This wire 13 stabilises the synthetic material carrier 1a in the critical edge area and, together with the seal 7, ensures that no moisture can penetrate into the door module 1. If the door module has large openings 14, e.g. for voluminous loud speakers, these openings 14 may have a wire-reinforced channel in addition to a seal 7.
[0020] FIGS. 2-4 show individual injection-moulded function elements in an enlarged view. In FIG. 2 a cable bush 9 consists of soft rubber, which is injection-moulded onto the synthetic material carrier 1a. In the same way, other installation openings can be made. In FIG. 3 a speaker mounting 15 may additionally have metal components 15b for reinforcement. In addition, a sealing cord 15a of soft rubber is injection

moulded on, which, after mounting of the speaker, seals this speaker from the door module 1. To fix the electric motors, special motor fixings 16 are provided, one example is shown in FIG. 4. Such a motor fixing 16 consists of a synthetic material part 16a and a metal reinforcement 16b as basic elements. Furthermore, the metal reinforcement 16b is surrounded by injection-moulded synthetic material 16c on one side and thus constitutes the motor support. For sealing purposes, a peripheral soft rubber cord 16d is injectioned on so that no moisture reaches the inner side of the door module 1. If the motor drives a cable drum, a holder 16e is provided therefor, which holder is injection moulded onto the metal insert reinforcement 16b. This holder 16a is formed as a clip so that a housing with a cable drum can be mounted by simple pushing and clipping.

[0021] The synthetic material components and reinforcement elements are inseparably connected to the synthetic material carrier Ia in one working step, whereby a door module can be manufactured cheaply and quickly and nonetheless has a sufficient stability due to the reinforcement elements.

Claims

1. A door module (1) for motor vehicles, intended for fixation to a door (2) of a motor vehicle and having a synthetic material carrier (1a) as a carrier element, and various function elements and/or reinforcements (11) fixed by synthetic material injection moulding or connected to the synthetic material carrier (1a) by means of injection-moulded synthetic material.

2. A door module (1) as claimed in claim 1, characterized in that the synthetic material carrier (1a) is formed tray-like and is a deep-drawn or stamped synthetic material component.

3. A door module (1) as claimed in claim 1, characterized in that the function elements are buffer elements (3), seals (7), locks (4) or fixings (8, 10, 11, 12, 6) which can be manufactured by injection moulding synthetic material onto the synthetic material carrier (1a).

4. A door module (1) as claimed in claim 1, characterized in that metal wires (13) for stabilising purposes are fastened in or on the synthetic material carrier (1a).

5. A door module (1) as claimed in claim 4, characterized in that the door module (1) has a peripheral channel (13a), which is intended to hold a wire (13) to seal the door module (1) from a door of a motor vehicle or a door lining.

6. A method of manufacturing a door module (1) for transport means, in which function elements and reinforcements (11) are inseparably connected to a synthetic material carrier (1a) in one working step.

7. A method as claimed in claim 6, characterized in that the synthetic material carrier (1a) is spot-connected to the reinforcement elements (11) by synthetic material injection moulding.

8. A method as claimed in claim 6, characterized in that function elements or reinforcement elements (11) are injection moulded onto the synthetic material carrier (1a).

9. A door of a motor vehicle with a door module (1) which is fixed to the door (2) of a motor vehicle and has a synthetic material carrier (1a) as a carrier element, and various function elements and/or reinforcements (11) fixed by synthetic material injection moulding or connected to the synthetic material carrier (1a) by means of injection-moulded synthetic material.

10. A motor vehicle with a door module (1) intended for fixation to a door (2) of a motor vehicle and having a synthetic material carrier (1a) as a carrier element, and various function elements and/or reinforcements (11) fixed by synthetic material injection moulding or connected to the synthetic material carrier (1a) by means of injection-moulded synthetic material.

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⑲日本国特許庁(JP)　⑪特許出願公開

⑫公開特許公報(A)　平2−264652

⑤Int.Cl.⁵	識別記号	庁内整理番号
A 61 B 17/36	350	7916−4C
1/00	334 D	7305−4C
A 61 N 5/06	E	8932−4C

⑬公開　平成2年(1990)10月29日

審査請求　未請求　請求項の数 1　(全2頁)

⑤④発明の名称　レーザプローブ

⑳特　願　平1−86219

㉒出　願　平1(1989)4月5日

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明　細　書

1、発明の名称

レーザプローブ

2、特許請求の範囲

光ファイバーを収納すせ柔軟な保護チューブと、前記保護チューブの先端に接続した金属製の保護チューブと、窓部材を保持するプローブ先端金属部と、前記両保護チューブを収納し前記プローブ先端金属部と接続した外管とから成ることを特徴とするレーザプローブ。

3、発明の詳細な説明

産業上の利用分野

本発明はレーザプローブ、特にその構造に関するものである。

従来の技術

従来のレーザプローブ先端部の構造を示す部分断面図を第2図に示す。

第2図に示すように、光ファイバー1をテフロンの保護チューブ2に収納し、窓部材4を保持するプローブ先端金属部5に挿入する。そして、外管6に保護チューブ2を収納し、外管6とプローブ先端金属部5とを接続してなる。

発明が解決しようとする課題

上記の構造において、光ファイバー1先端から出力されたレーザ光の一部が窓部材4により反射され、プローブ先端金属部5の内部を加熱し、熱伝導もしくは反射光が直接テフロンの保護チューブ2を加熱して溶融させる。その結果、光ファイバー1を劣化させる。

また、光ファイバー1を収納する保護チューブ2をすべて金属製のチューブにすると、弾性のために内視鏡に挿入した時、内視鏡の曲げ性に制限を与え、操作性を損うことになる。

課題を解決するための手段

上記課題を解決するため、本発明は、光ファイバーを収納する保護チューブを柔軟なチューブと金属製のチューブを接続して構成し、金属製のチューブをプローブ先端金属部に挿入する構造としたものである。

作　用

上記構成により、窓部材からの反射光の影響で、柔軟なチューブが溶融することがないため、光ファイバーは劣化しない。

また、保護チューブは、先端部のみ金属製のチューブとし、他部は柔軟なチューブなので、内視鏡挿入時に内視鏡の曲げ性に制限を与えたり、操作性を低下させたりすることはない。

実施例

本発明による一実施例を第1図に示し、第2図と同一番号は同一部材を示す。

第1図において、1はCO_2レーザ用の塩化銀ー臭化銀製の光ファイバーであり、テフロンの保護チューブ2とステンレス製の保護チューブ3に収納し、窓部材4を保持するプローブ先端金属部5にステンレス製の保護チューブ3側を挿入し、接着してある。このとき、ステンレス製の保護チューブ3をテフロン製の保護チューブ2に圧入し接続させる。そして、テフロン製の外管6は保護チューブ2，3を収納し、プローブ先端金属部5に接続してある。

発明の効果

以上のように本発明によれば、窓部材からの反射光の影響で保護チューブが溶融することがないため、これが原因で光ファイバが劣化することがない。

また、内視鏡挿入時に内視鏡の曲げ性に制限を与えたり、操作性を低下させたりすることはない。

4、図面の簡単な説明

第1図は、本発明の実施例を示すレーザプローブ先端部の部分断面図、第2図は、従来のレーザプローブ先端部の部分断面図である。

1……光ファイバ（塩化銀ー臭化銀）、2……テフロンチューブ、3……ステンレスチューブ、4……ウインド、5……プローブ先端金属部。

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この構造により、レーザ照射時に光ファイバー1先端から出力されたレーザ光の一部が窓部材4により反射され、プローブ先端金属部5内部及びステンレス製の保護チューブ3を加熱するが、従来のテフロンチューブの様に溶融することがないため、これが原因での光ファイバー1の劣化がなくなる。また、保護チューブは、先端部のみステンレスチューブとし、他部はテフロンチューブなので、内視鏡挿入時に内視鏡の曲げ性に制限を与えたり、操作性を低下させたりすることはない。

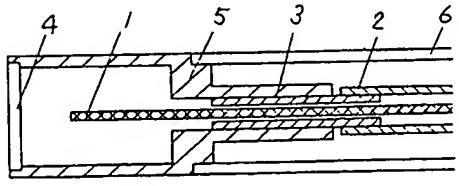
なお、光ファイバーをCO_2レーザ用塩化銀ー臭化銀の光ファイバーとして説明したが、タリウムハライド系ファイバーやカルコゲナイド系光ファイバーでも同様の効果が得られる。

また、保護チューブとしての金属チューブをステンレスチューブとして説明したが、銅や金チューブを用いても良い。

また、保護チューブとして、テフロンチューブを用いて説明したが、他の樹脂チューブやゴムチューブを用いても同様の効果が得られる。

1…光ファイバー(塩化銀-臭化銀)
2…テフロンチューブ
3…ステンレスチューブ
4…ウインド
5…プローブ先端金属部

第1図



第2図